Claims

1. A porous self-supporting structure comprising at least two porous components A and B and the porous component B embraces the porous component A, wherein

   (i) surfaces of pores of the at least two porous components A and B are provided with chemical moieties for interaction with substances passing the pores and

   (ii) the pores of the porous components comprise a uniform multimodal pore size distribution through the entire polymeric structure.

2. The porous self-supporting structure of claim 1 wherein the structure comprises a polymer obtainable by polymerisation of monomers having at least two polymerisable moieties or two types of monomers the first monomer type having one polymerisable moiety and the other monomer type is able to crosslink polymer chains obtained by polymerisation of the first monomer.

3. The porous self-supporting structure of claim 1 wherein the surfaces of the pores are modified with functional groups such as ion-exchange groups, hydrophobic moieties, reactive groups for covalently binding of ligands such as affinity ligands, preferably proteins, enzymes, immunoglobulins, antigens, lectins, sugars, nucleic acids, cell organelles, or dyes, etc.

4. The porous self-supporting structure of claim 2, wherein the monomers are poly vinyl monomers and monovinyl monomers.

5. The porous self-supporting structure of claim 3, wherein the group of polyvinyl monomers include divinylbenzene, divinylnaphtalene, divinylpyridine, alkylene dimethacrylates, hydroxyalkylene dimethacrylates, hydroxyalkylene diacrylates, oligoethylene glycol diacrylates, vinyl polycarboxylic acids, divinyl ether, pentaerythritol di-, tri-, or tetra methacrylate or acrylate, trimethylolpropane trimethylacrylate or acrylate, alkylene bis acrylamides or methacrylamides, and mixtures thereof.

6. The porous self-supporting structure of claim 3, wherein the group of monovinyl monomers include styrene, ring substituted styrenes wherein the substitution include chloromethyl, alkyl with up to 18 carbon atoms, hydroxyl, t-butyloxycarbonyl, halogen, nitro-, amino- groups, protected hydroxyls or amino groups, vinylnaphtalene, acrylates, methacrylates vinylacetate and pyrrolidone, and mixtures thereof.

7. The porous self-supporting structure of claims 4 and/or 5, wherein the polyvinyl monomer or polyvinyl monomer plus the monovinyl monomer are present in the polymerisation mixture in an amount of 20 to 60%.

8. The porous self-supporting structure of claim 1, wherein the first component B comprises a tube like structure having an inner lumen (10) with an inner diameter (12) and an outer diameter (11) which lumen (10) is able to take up the second component A having an inner lumen (20) with an outer diameter (21) and an inner diameter (22) with the proviso that the outer diameter (21) of component A matches the inner diameter (12) of component B and component A is inserted in component B.

9. The porous self-supporting structure of claim 8, wherein the inner lumen (20) of component A is a sample collector.

10. An article comprising a porous self-supporting structure according to any one of the foregoing claims and means for carrying out chromatographic processes.

11. The article according to claim 10, wherein the article is a chromatographic unit (30) column or cartridge or a bioconversion reactor or matrix for peptide or oligonucleotides synthesis.

12. The article of claim 11 comprising a housing (36) providing a sample distributor 23 in which component D is arranged, the housing (36) having at least one inlet (41) and at least one outlet (40), an inner surface (42) and an outer surface (43) and a channel like structure or channel like structures (72) forming a sample distributor (23) on its inner surface (42).

13. The article of claim 12, wherein the channel like structure (72) is a helical groove (25) starting at the area of and being in direct contact with the inlet (41) of the chromatographic unit (30) and terminating after at least one complete turn but not in direct connection with the outlet (40) of the chromatographic unit (30).

14. The article of claims 11 to 13, wherein the chromatographic unit (30) further comprises a first end-fitting (32) and a second end-fitting (38), having O-rings (33,34,35,37) and tightening nuts (31,39).

15. The article of claim 14, wherein the second end-fitting (38) has a top part (52), a bottom part (53) and a casing, the second end-fitting (38) is essentially of cylindrical shape, the second end-fitting (38) comprises a collar (51) dividing the cylindrically shaped end-fitting (38) into two parts, whereby the part of the end-fitting (38) nearest to the collar (51) is the top part (52) comprising a connector (50) in connection with a dead-end central bore (54) communicating with a bore (55) which is perpendicular to the dead-end central bore (54), the bore (55) starts in a ring-like groove (56) at the surface of the casing of the second end-fitting (38) and leads into the dead end central bore (54).

16. The article of claim 14, wherein the first end-fitting (32) has a top part (62), a bottom part (63) and a casing, the first end-fitting (32) is essentially of cylindrical shape, the first end-fitting (32) comprises a collar (61) dividing the cylindrically shaped end-fitting (32) into two parts (62,63), whereby the part of the end-fitting (32) nearest to the collar (61) is the bottom part (62) comprising a connector (60) in connection with a central bore (64) extending through the entire first end-fitting (32) and an O-ring (35) placed in a ring-like groove in the casing at the area of the top part (63) of the first end-fitting (32) and O-rings in circular grooves in the top part (63) of the first end-fitting (32).

17 A housing (36) for use in the article of claim 12 providing a sample distributor (23) wherein the channel like structure (72) is a helical groove (25).

18. A first end-fitting (32) or a second end-fitting (38) for use in the article of claim 14.

19. A collecting element (80) for use in the article of claim 10.

20. Process for manufacturing a porous self supporting structure of claim 1 comprising the steps of

- mixing monovinyl and polyvinyl monomers together with porogens and optionally with polymerisation initiators,

- optionally deaeration,

- pouring the mixture in a mould for casting a tube-like structure,

- controlling the temperature in a range of from 40°C to 90°C,

after formation of the polymer, removing porogens unreacted monomers and initiators or by-products.